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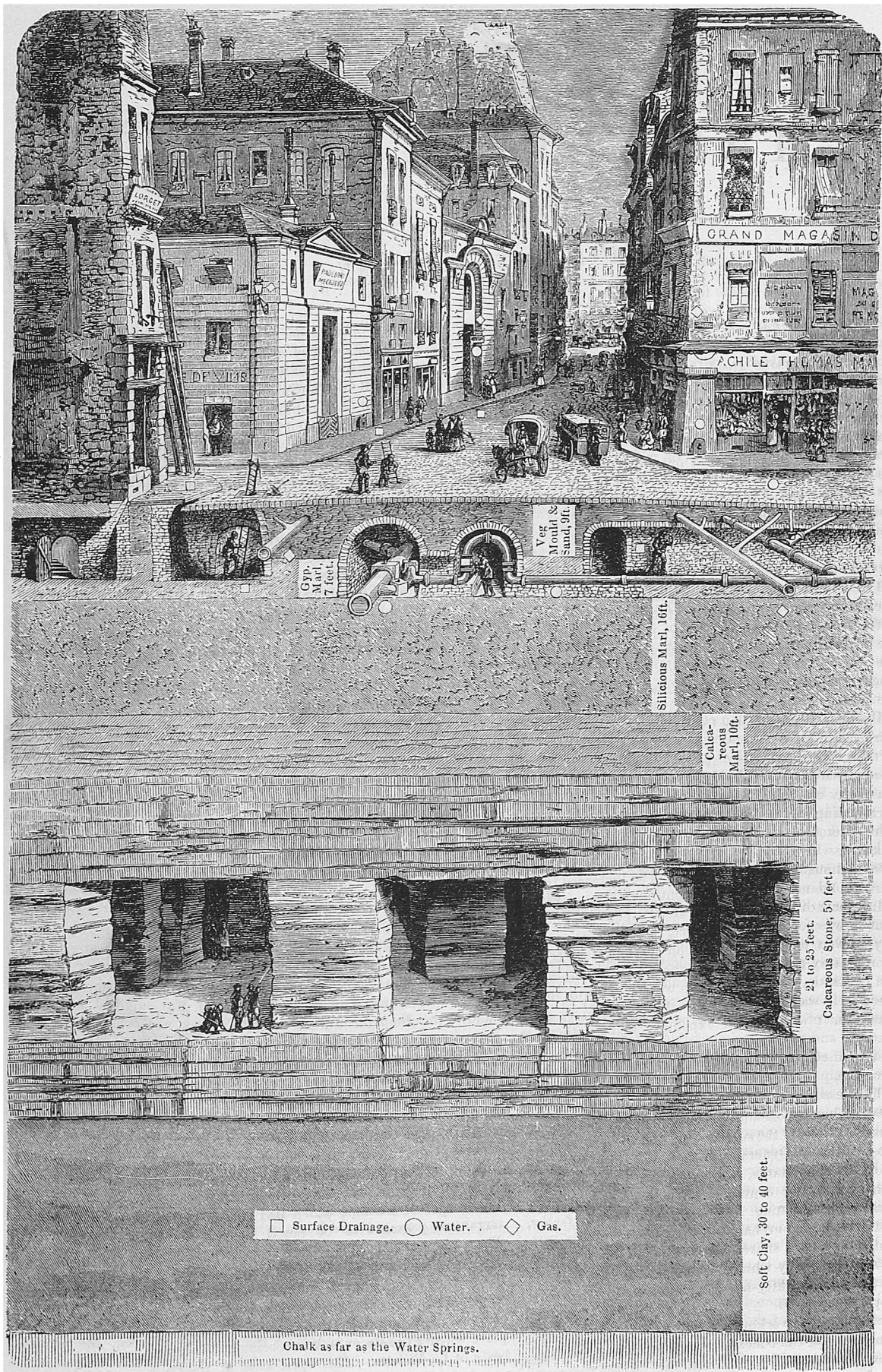
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SECTION OF THE SOIL UNDER A STREET IN PARIS.

THE ILLUSTRATED MAGAZINE OF ART.

PARIS UNDERGROUND.

BENEATH visible Paris, where light shines both night and day, and where 1,200,000 persons live and bustle about so noisily, is another Paris, invisible, dark, silent, and immense. From north to south, from east to west, the ground, upon which these 1,200,000 persons tread, is excavated, ploughed up, and perforated in all directions; and it may be said, that nearly all the streets through which the public pass correspond with subterranean ones, on which depend, in a manner, the health and lives of all who live in Paris. Were it not for these streets, which are shut out from every eye, those which are above them would soon be filled with a thousand dangers. Subterranean canals, conduits, and sewers, pervade the whole extent of the great city, and are necessary to its very existence.

The oldest of these excavations were made for the purpose of constructing the city itself. Paris has literally sprung out of the bowels of the earth; and it would never have attained the gigantic size which now renders it one of the first cities of the world, had it not been for the rich quarries that were discovered, some eighteen hundred years ago, on the banks of the Seine.

During the domination of Rome, towards the end of the third century, at which time Lutetia did not extend much further than the island of the Cité, large beds of lime-stone were discovered on the left side of the Seine, where the faubourgs St. Marceau and St. Germain now stand. All the surrounding places, Montsouris, Gentilly, Montrouge, &c., were therefore excavated in succession. Some of these quarries, which it might be thought fourteen centuries would have exhausted, still supply materials for the construction of Parisian houses.

In course of time, however, the city had so increased in size that it was found necessary not to continue the excavations any further beneath the ground it stood upon. Edifices of enormous weight, such as Val-de-Grâce, the Observatoire, and the Panthéon, were actually standing on deep abysses. It was, therefore, necessary to strengthen, as speedily as possible, the foundation of one-half of Paris. The work was begun immediately; and as it was impossible for the crypts to be completely filled up, it was deemed expedient to turn them to some use.

The dead were still interred within the walls of the city in 1780. The principal cemetery was that of the *Innocents*, which occupied the site where the present market-place now stands. Most serious accidents constantly occurred in the neighbourhood, and all the cellars of the surrounding houses were infected. Lenoir, the Lieutenant-General of Police, resolved, on being petitioned by the inhabitants, to do away with this cemetery, and to have the bones it contained carried into the quarries which required strengthening. A house, called *Tombe-Issoire*, having, therefore, been purchased in the plain of Montsouris, on the old Orleans road, a staircase, consisting of seventy-seven steps, was constructed, by which to descend into the excavations to a depth of about fifty-five feet; and a well walled with bones was also constructed.

A great number of workmen were, at the same time, employed in arranging the bones in compact rows and masses, and in making communications between the various passages, so that these bones soon formed a number of streets, of places, and, so to speak, of monuments. These immense works were

finished in 1786. After their transformation, the quarries took the name of *catacombs*; they had received, first of all, the bones from the cemetery of the *Innocents*, and then those from several others which were suppressed in 1792, 1804, 1808, 1809, and in 1811. They are said to contain more than forty generations, and their population is accounted eight times more numerous than that which is above them.

The catacombs contain two different collections, the first being composed of samples of the various kinds of earth and stone which form their foundation; while the second is a pathological collection, in which are methodically classed all the different sorts of bones deformed by disease.

From north to south, they extend from the Rues de l'Ecole-de-Médecine, Jacob, &c., to the Barrière Vaugirard, and from west to east, they extend from the same barrier to the Jardin des Plantes. The whole of the left side of Paris is, therefore, excavated. These subterranean places are supplied with walls of circumvallation like Paris itself, they follow nearly the same curve, and are constructed for the same purpose as the upper walls; that is, in order to foil the audacity of the defrauders of the custom-house, who, not hesitating to profit by the badly-guarded roads of the catacombs, entered them through the openings at Montrouge or Vaugirard, and issued from them in the interior of Paris, through other openings communicating with secret cellars.

The quarries on the right side of the Seine are far from ever having been worked on so extensive a scale as those on the left side. Montmartre and Belleville, &c., are rather deeply excavated; but, properly speaking, these places do not form a part of Paris. Subterranean Paris on the right side of the Seine is a perfect labyrinth of arched sewers, and channels containing water and gas-pipes: these conduits also envelop the left side in their net-work.

The pipes for supplying the city with clean water, and the drains for carrying off the dirty water, have nearly the same origin, and were laid down at nearly the same time.

Till the ninth century, the city was supplied with water by the aqueduct of Arcueil, which was constructed in 360, under the Emperor Julian. The Normans destroyed this aqueduct in the ninth century, and the city was left without any water-pipes whatever. The aqueduct was not reconstructed before 1543; afterwards the aqueducts of the Près St. Gervais and St. Martin were built, and henceforth, the streets of Paris continued to be filled with channels, more or less deep, in order to allow the water-pipes, of which the number increased every year, to be laid down. Under Henri IV., the pumps of the Samaritaine were constructed on the Pont Neuf; afterwards, were established the hydraulic machines of the Pont Notre Dame, which also caused several other subterranean passages to be bored beneath the public ways. The pump of Chaillot dates from 1782, and that of the Gros-Caillou from 1785. Under the empire, the Canal de l'Ourcq was constructed, and the water-pipes of the capital were, in consequence, greatly increased. Most of the water of Paris is supplied by the Canal de l'Ourcq, the principal place whence the water is drawn being at the lower end of the basin of La Villette. This open kind of reservoir is arched over before it enters the city, and forms a vault, which, under the name of *aqueduc de ceinture*, runs from east to west, under all the northern part of Paris, from the Villette to Monceau

its length being nearly two miles and a half. The *aqueduc de ceinture* communicates with the canal at the Villette by means of sluices furnished with valves. From this aqueduct branch off several smaller ones which, in their turn, communicate with a multitude of pipes that carry the water into the very heart of Paris, and supply about fifty large public fountains. The branch water-pipes increased to an unlimited extent under the government of Louis Philippe. From 1838 to 1845, five large reservoirs, capable of containing about six million and a half gallons of water, were constructed; from 1845 to 1848, the well of Grenelle was bored, and the pump of Austerlitz constructed. The number of public fountains, which did not amount under the empire to more than forty, amounts at present to ninety-four, there being sixty-five on the right side, and twenty-nine on the left side of the Seine. The total number of apparatuses for the distribution of water throughout the entire city amounts to two thousand and thirty-three, and yet this is not sufficient to satisfy all its wants. At Paris there is only water enough to allow each person fifteen gallons a day; at London, each person can be supplied with twenty-four gallons; and at Philadelphia, with seventy-three gallons.

The first works undertaken for carrying off the foul water of Paris were executed slowly, and in a defective manner. Formerly, the shores of the Seine, in consequence of their being raised by the successive layers of alluvium left there by the rising of the river, and by the heaps of rubbish shot on them, formed behind them a sort of hollow, at the foot of the hills of Mémilmontant, Belleville, Montmartre, and Du Roule. This hollow served as a drain, and was a kind of natural sewer, into which ran all the rain water of the north of Paris, from Mémilmontant to the bottom of the heights of Chaillot, where it emptied itself into the Seine; it was, therefore, called the great or main sewer. One of the conduits which ran into it from Montmartre, having been enclosed in the fourteenth century, in the *enceinte* formed by Charles V., Hugues Aubriot, who was then provost of the merchants, had it arched over, and thus constructed the first real sewer. A number of conduits, similar to the one which had been covered over, ran through the city in all directions. The principal ones were those of Du Pouceau, of St. Antoine, of the Filles-du-Calvaire, of the Temple, &c.; properly speaking, however, they were nothing but infectious receptacles for filth. Some of them were arched over in the fourteenth century. The sewer of the Rue St. Antoine was covered over before 1412; it emptied itself into the ditches of the Bastille, and was known by the name of *Pont Perrin*. But the kings of France, who then inhabited the Hôtel St. Paul, disliking to have such a thing so near them, changed its course, and had it turned through La Culture St. Catherine, towards the enclosure of the Temple. It was again arched over in several places along its new course. Things remained pretty nearly in the same state till 1605. At this epoch, François Mirou, provost of Paris, with the aid of the municipal and his own resources, began fresh constructions of considerable importance. He had the sewer Du Pouceau arched over at his own expense, from the Rue Saint Denis to the Rue Saint Martin. His successors, however, were not actuated with the same zeal for public salubrity. A description, however, of the sewers of Paris, drawn up in 1663, and in which they are divided into open and covered sewers, tells us that the former extended to a length of four miles four furlongs twelve chains and a half, and the latter to a length of one mile three furlongs one chain and a half. This was at all events a beginning; and the subterranean works, which are so useful to the inhabitants of Paris, were continued from generation to generation up to the present time. The finest sewer of the city is the one constructed by Napoleon in the Rue de Rivoli; and it corresponds in magnificence with the monumental structures which rise above it. The next sewer which is looked on in the light of a *chef-d'œuvre* is the one of the Rues Saint Denis and Du Pouceau, which extends to the Marché des Innocents. This sewer serves two purposes; it conveys through its channel both foul and clean water, the latter being contained in pipes supported by two rows of brackets, while

the former runs along the bottom of the sewer. This was the first sewer which was used for a double purpose; but since its construction, several others have been made in the same manner. Some of the more recent ones have even been used for three different purposes, being also made to convey gas by means of large tubes placed parallel with the water pipes.

It is only since the last twenty years that the municipality of Paris has seriously thought of directing these useful works in a methodical manner. First of all, the levels of the sewers already constructed and of those about to be so were taken; then the making of the trenches and the execution of the masonry work were considered. From 1835, above six miles length of sewerage has been constructed yearly. The underground of all the streets of Paris is, with few exceptions, pierced through and through in all directions. If the reader adds to these sewers the innumerable channels made for conveying clean water to all parts of Paris, and the gas-pipes which have been lately laid down all over the capital, he will have some idea of the labyrinth of conduits of all sorts and sizes which exist in every direction beneath the streets of Paris.

All these sewers have two sorts of apertures opening on the public way, one to allow the water to pass through, and the other to admit of their being entered when they require to be cleaned, repaired, or inspected. When the apertures, through which the water passes, called in this country shoots or gully-holes, are in the road, they are covered with a grating, which rests on a wooden frame, supported by stone work; the openings beneath the foot pavement have granite coverings when the pavement is raised high enough to permit it, but otherwise the coverings are made of cast-iron. The openings through which the sewers are entered, called man-holes, are covered with cast-iron slabs of a circular form.

In order to let out the confined air, and to keep the sewers free from infection, vent-holes, supplied with vertical pipes, having valves at their lower extremity, are made at short distances from one another, or else this pipe is made to communicate with the pipes that run down the neighbouring houses.

The inclination of the sewers of Paris is at the rate of at least .03937 of an inch for every three feet three inches.

It has in general been remarked that the walls of the sewers, which come most in contact with the water, become at length covered with a substance that is much harder than stone, and which cannot be broken into by a pick-axe without bringing away bits of the wall. This singular substance very much resembles that found in old lead and cast-iron pipes which have long been employed for household uses. The sewers are filled with various odours, faint, ammoniacal, sulphuretted, &c., and those who clean them do not always escape accidents. The operation of cleansing is very easy. The cleaner pushes the filth before him by means of a piece of board fastened to a long handle. First of all, however, he generally places a strong plank across the sewer to stop the water. The water accumulates in consequence, and when the plank is taken away, it rushes forward with sufficient rapidity to carry the greater part of the mud and filth along with it.

Little do the uninitiated imagine, as they see the clean water rushing down the sides of the streets, what time and thought, what perseverance and patience it has required to bring that water there; little, too, do they imagine, as they empty their dirty water into the iron basin, that is fixed outside the houses at every floor, and see it disappear down the pipe communicating with each basin, what a complicated network of canals has been devised to fill their abodes with health and cleanliness.

And who ever thinks of, or pities, the poor cleaner, the man in jack-boots, and tight-fitting clothes, who at one moment is seen going along the street with a long ladder on his shoulder, and the next moment suddenly disappears no one would know where, if the top of his long ladder did not rise a little above the man-hole to indicate the direction he has taken?

"Infelix, cui te exitio reservat fortuna?"

He has gone to earn his scanty bread, by providing, at the risk of his own life, for the health and safety of the city!